

**Redefinition of the milliped genus *Pycnotropis*, and description of a new species from Manaus, Brazil
(Polydesmida: Platyrhacidae: Euryurinae)**

by

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Abstract

Pycnotropis epiclysmus is described from material collected in inundation forests near Manaus, Amazonas, Brazil. The genus is redefined on the basis of an overlooked diagnostic character, gonopods of the type species *P. taenia* (PETERS) are illustrated, and a list of presumably congeneric species is provided. The generic names *Phinotropis* and *Amydrinus* (CHAMBERLIN 1941) are confirmed as junior synonyms of *Pycnotropis*, their respective type species being considered as conspecific. Difficulties associated with determining the relationships of the nominal subfamily Euryurinae are outlined for future consideration.

Keywords: Diplopoda, Platyrhacidae, Euryurinae, Amazonia, inundation forest.

Resumo

Pycnotropis epiclysmus é descrita de material coletado numa floresta inundável perto de Manaus, Amazônia, Brasil. O gênero é redefinido, baseado em caracteres diagnósticos anteriormente não reparados; os gonópodos da espécie tipo de *P. taenia* (PETERS) são ilustrados, e uma lista de espécies provavelmente congêneras é dada. Os nomes genéricos *Phinotropis* e *Amydrinus* (CHAMBERLIN 1941) são reconfirmados como sinônimos júnior de *Pycnotropis*, e as suas espécies tipos estão sendo consideradas conspecíficas. Dificuldades associadas com a determinação de relações da subfamília nominal Euryurinae são indicadas para futuras considerações.

Introduction

The following species is described in advance of a general review of the subfamily Euryurinae to provide its name for use by Prov.-Doz. Dr. J. ADIS in his on-going studies of inundation forest arthropods (cf. ADIS 1992; ADIS & MESSNER 1995). An additional justification for describing yet another new tropical milliped outside a group treatment is the opportunity that is provided to present a revised definition of *Pycnotropis*, hitherto only vaguely defined and dissentiously treated by various authors.

Pycnotropis was proposed by J. CARL in his "Diplopoden von Colombien" (1914) to include *Polydesmus* (*Euryurus*) *taenia* PETERS (designated as type species), *Polydesmus polygonatus* GERVAIS, *Euryurus flavocarinatus* SILVESTRI, *Euryurus melano stigma* SILVESTRI (all from Colombia) and *Euryurus devillei* SILVESTRI from Ecuador. CARL distinguished a group of related genera (*Euryurus*, *Amplinus*, *Polylepis-**cus*, *Aphelidesmus*, and *Pycnotropis*) without implicating any collective higher taxon although its equivalence to the Euryurinae *sensu* POCKOCK 1909 is clear. These five genera were separated by CARL in a key based almost entirely upon peripheral body characters, setting a precedent which endured for quite some decades later. In his comprehensive treatment of platyrhacid millipeds in 1938, Graf ATTEMS utilized CARL's characters (texture of metaterga, shape of paranota, shape of hypoproct, etc.) to distinguish four of the same genera (except for *Aphelidesmus*, which he had previously relocated into the family Strongylosomidae). Following ATTEMS, R.V. CHAMBERLIN adopted the same kinds of characters to justify new Peruvian euryurid genera in 1941.

In the shadow of ATTEMS' great authority, I also relied - as recently as 1954 - upon these superficial generic characters until later experience showed that they did not correlate with groupings based upon genitalic characters. The examination of many type specimens in European museums during the period 1960 - 1975 and of abundant undescribed material was sufficient to show that both *Pycnotropis* and *Polylepis-**cus*, as presented in ATTEMS' 1938 book, were heterogeneous and divisible into a number of monophyletic groupings of presumably generic rank. As the already prolonged gestation period of a comprehensive treatment seems destined to endure still longer, the opportunity to provide a new concept of *Pycnotropic* is welcome and timely.

I express my best thanks to Dr. ADIS for providing the material and for his patience in waiting many years for the presentation that follows.

Family Platyrhacidae

Subfamily Euryurinae

A derived (specialized) character shared by nominal "platyrhacines" and nominal "euryurines" but not by other chelodesmoids is the presence of compound or tufted setae on the labrum and terminal body segment (Fig. 5). If such setae are regarded as a family-level character, the two component taxa can be regarded as subfamilies, as done here. Alternatively, each could be ranked as a family, elevating the setal apomorphy to one of superfamilial importance. Eventually this can be sorted out as polydesmidan families become cladized. The distinction between the two taxa is still ambiguous, meaning that no clearcut and absolute apomorphies have been established for either. Traditionally the platyrhacids were distinguished because of the location of the ozopores

in a flat polished disk well-removed from the paranotal edge (which has no peritrematic thickening). This character breaks down in some Indonesian genera like *Taphodesmus* and *Erythracus*, in which the pore actually opens laterally on the paranotal edge in a perceptible thickening. Of course, in general facies, such species still "look like" platyrhacids and should not be allowed to discredit a useful functional distinction.

A hitherto unpublicized character of possible importance was pointed out to me many years ago by C.A.W. JEEKEL, the fact that in euryurines the prozonal surface is smooth and polished, whereas in platyrhacines it is roughened either by dense microgranulation or coarse isodiametric meshwork. No exceptions to this generality have been noted in the many genera which I have examined. The same difference separates the Plagiodesminae from the other two subfamilies of Oxydesmidae, in which it seems scaled correctly at the subfamily level.

The current lack of any convincing apomorphy for "euryurids" is an additional, concurrent, complication. However, I remain convinced that good classifications (and cladograms) can only be based upon genera of unimpeachable character (e.g., monophyletic), and that higher level solutions will have to wait for completion of a lot of old-fashioned, beta-taxonomy generic revisions.

Pycnotropis and *Polylepis-**cus* were both heterogeneous as treated by ATTEMS in 1938, the latter containing species now dispersed into four genera. Although I am not now able to present a satisfactory arrangement of all Neotropical euryurines it is possible to make a start by providing an exclusive definition of *Pycnotropis* based on a previously unrecognized, apomorphic character.

Pycnotropis

Pycnotropis CARL, 1914, Mem. Soc. neuchat. Sci. nat., v. 5, p. 932. Proposed for five species. Type species: *Polydesmus* (*Euryurus*) *taenia* PETERS, 1864; ATTEMS, 1938, Das Tierreich, Lief. 69, p. 296; HOFFMAN, 1980, Classification of the Diplopoda, p. 164.

Phinotropis CHAMBERLIN, 1941, Bull. American Mus. Nat. Hist., v. 78, p. 499. Proposed with a new species. Type species: *Phinotropis tidus* CHAMBERLIN, 1941, by original designation and monotypy.

Amydrinus CHAMBERLIN, 1941, Bull. American Mus. Nat. Hist., v. 78, p. 500. Proposed with a new species. Type species: *Amydrinus pongus* CHAMBERLIN, 1941, by original designation and monotypy.

Name: Latinized Greek, *pycnos* (thick) + *tropis* (side, rim), referring to the incrassate paranotal lateral edge of the referred species. Gender feminine.

Diagnosis: Prefemur of gonopod about half total length of telopodite, set off distally by distinct constriction or cingulum; two distal elements, one a short, falcate ventrally directed solenomere with distinct membranous area on ventral side of its base (Fig. 1: "X"), the second (?tibiotarsus) much longer, sigmoidally sinuate, flattened, ventrally directed.

Remarks: As defined above, this genus contains species in which the metaterga are conspicuously areate as well as others in which dorsal sculpture is weak and confined to the paranota only.

The two generic synonyms cited above were "diagnosed" with a degree of superficiality remarkable even for CHAMBERLINian standards. *Phinotropis* was proposed for one species "in which the male gonopods differ from those of *Thrinoxethus* in having the major distal branch entire and distally acute like the minor branch." This type species, *P. tidus*, was described as having the "middle region of all tergites smooth and shining, polygonal areas evident only adjacent to keels." The definition of *Amydrinus* stated that the type species was "in structure very similar to *Phinotropis* but differing in having the tergites almost wholly smooth, lacking polygonal areas except for a few more or less vague ones adjacent to the

keel on each side." The small sketches provided for the two type species *P. tidus* and *A. pongus* suggest identical structure (as confirmed by recent comparison of the two type specimens involved). The sole difference mentioned to separate the two from each other is nothing more than the **relative** prominence of polygonal tergal areas near the paranotal bases (which in fact does not exist)! It is difficult to take such taxonomy seriously, the more so since not a word was devoted to distinction between these two nominal "genera" and *Pycnotropis* itself.

There are a number of additional euryurids known from the northern Andes which have a similar gonopod pattern: short, acute solenomere and much larger, longer, often sigmoidally curved, solenophorous tibiotarsus. By resort to the presence of a distinct membranous "vesicle" at the base of the solenomere (Figs. 1 and 8: "X") as a generic character (which in the judgement of posterity it may or may not be), one derives a small group of apparently related species occupying a cohesive geographic range. Obviously a synapomorphy for these nominal species, the structure itself may be formally named **vesicula** (Lat., a little blister, which it resembles). There is nothing comparable in any other euryurids known to me, and of course the function cannot even be imagined at this point in time.

Aside from four undescribed species from Ecuador, the following species may be referred to *Pycnotropis* in this restricted sense. Inclusion in the list does not necessarily mean that I have verified validity of specific status, and not all species have been studied from material (some need to be rechecked for presence of the vesicula). The list is formed chronologically, species name followed by original generic name parenthetically, and country of origin.

taenia PETERS, 1865 (*Polydesmus*); Colombia
flavocarينات SILVESTRI, 1898 (*Euryurus*); Colombia
melanostigma SILVESTRI, 1898 (*Euryurus*); Colombia
acuticollis ATTEMŠ, 1899 (*Pachyurus*); Brasil
braueri CARL, 1918 (*Polylepiscus*); Ecuador
haenschii CARL, 1918 (*Pycnotropis*); Ecuador
tidus [recte *tida*] CHAMBERLIN, 1941 (*Phinotropis*); Peru
pongus CHAMBERLIN, 1941 (*Amydrinus*); Peru
nitidus [recte *nitida*] KRAUS, 1959 (*Pycnotropis*); Peru
achiraensis KRAUS, 1959 (*Pycnotropis*); Peru
subareatus JEEKEL, 1963 (*Amplinus*); Brasil

Pycnotropis taenia (PETERS) (Fig. 1)

Polydesmus (subgenus *Euryurus* by implication) *taenia* PETERS, 1865, Monatsb. Akad. Berlin für 1864, p. 626. Two ♀♀ syntypes (ZMB 3021) from Bogota, Colombia, A. LINDIG leg.).

Euryurus taenia: ATTEMŠ, 1899, Denks. Akad. Wien, vol. 68, p. 280.

Pycnotropis taenia: CARL, 1914, Mém. Soc. neuchâtel. Sci. nat., vol. 5, p. 935, figs. 195, 196; ATTEMŠ, 1938, Das Tierreich, Lief. 69, p. 296, fig. 333; HOFFMAN, 1951, Proc. U.S. Nat. Mus., vol. 102, p. 240.

Amplinus taenia: JEEKEL, 1963, Stud. Fauna Suriname, vol. 4, p. 75.

Although species based upon female material are often not identifiable with confidence, particularly those from tropical regions, it seems likely that CARL correctly associated his specimens from Tambo and Argelia, Colombia, with the female syntypes of *taenia* (which he personally examined). Both of the localities represented are not distant from Bogota and the peripheral characters of the species would seem to be definitive. CARL's figures of the gonopods, while reasonably accurate, do not show the vesicula precisely, and I give here a new drawing made from a specimen in the British Museum (Natural History), to which CARL donated or sold numerous millipeds, including his types. Unfortunately, the label states only "Colombia, FUHRMANN leg." CARL's figure 195 portrays the tibiotarsus as much narrower than it

is in actuality, perhaps foreshortened from the aspect of the gonopod during illustration which seems to be more obliquely ventromedial.

Pycnotropis epiclysmus, new species (Figs. 2-8)

Name: Gk. *epiclysmus*, a flood, in reference to occurrence of the species in Amazonian inundation forest. Masculine.

Material: ♂ holotype and many topoparatypes of both sexes (INPA) from Lago Jaunari (03°20'S, 60°27'W), mixedwater inundation forest (cf. ADIS 1992; ADIS & RIGHI 1989), about 10 km southwest of Manaus, Amazonas, Brazil, J. ADIS leg. 17 June 1987; also two ♂ and two ♀ topoparatypes (VMNH) from same collection. Many ♂♂ and ♀♀ from Manaus, INPA campus, secondary upland forest (non-flooded terra firme), ADIS leg., April - May 1984; thirteen ♂ and two ♀ from Ilha de Careiro (3°14'S, 59°44'W); whitewater inundation forest near Furo Capitarí, about 30 km west of Manaus, ADIS et al. leg. July 27, 1995.

Diagnosis: A small species of *Pycnotropis* with yellowish spot occupying most of middorsal surface of each metatergum; prozona dark, without middorsal spot of contrasting color; tergal areation reduced to a few indistinct fields near base of paranota; secondary branch of gonopod slender, distally attenuated, slightly sinuous, of the form shown in Figure 7. Differences from the closely related *P. tida* occur in the shape of midbody paranota and epiproct (cf. Figs. 3 and 9, 5 and 10).

Holotype: Adult male, approximate length 46 mm, W/L ratio ca. 12 %. Coloration of preserved animal dark gray to piceous dorsally, metaterga with large suboval median light spot, these increasing in size posteriad until nearly touching light paranotal spot on last several segments; all but extreme base of epiproct light, yellowish-orange in life. Legs and antennae dark brownish yellow.

Segments only moderately telescoped with paranota separated except on anteriormost segments. Lengths of representative segments (across paranota):

1 - 5.1 mm	10 - 6.5 mm
2 - 6.0	12 - 6.5
4 - 6.3	14 - 6.5
6 - 6.5	16 - 6.3
8 - 6.5	18 - 5.2

Head smooth and polished except distinctly striate behind antennal bases, epicranial groove prominent between antennae; median groove of genae deep, surface dorsad of groove strongly convex. Interantennal space (1.0 mm) equal to length of 2nd antennomere. Labral setae ca. 6-6, clypeal 3-3, setae compound in both series.

Collum transversely oval, ends declivent, surface largely smooth, entire anterior edge distinctly marginate, posterior edge only along extent of paranota thus smooth middorsally. Anterior metaterga notably convex with declivous paranota, aspect gradually becoming increasingly flattened posteriad as paranota approach horizontal by midbody, and middorsum only slightly convex. Surface smooth and polished except for four (occasionally three or five) polygonal fields on anterior half of paranota. Latter relatively small, subhorizontal, of the form shown in Figs. 2 and 3, posterior edge strongly marginate, very finely crenulate; anterior edge not strigose. Epiproct (Fig. 5) large, apically spatulate-rounded as illustrated. Paraprocts smooth and polished, the disk convex, set off from rim by moderate groove, dorsal setae located in groove, not quite in contact with base of rim. Hypoproct nearly hemispherical in outline, without median projection, moderately convex.

Sterna moderately elevated, smooth and glabrous, slightly wider between anterior legpair (0.7 mm) and subequal to length of coxa; each bilobed between posterior legpair. Legs smooth and polished, only sparsely setose, without modification. Segments smooth laterally, stricture distinct and deep but without sharp edges; a small field of tiny acute spicules beneath caudal third of each paranotum; caudal edge of

each segment with a series of small rounded denticles extending across venter and about halfway up sides. Limbus broad, hyaline, and finely striate, edge not modified.

Sterna of segments 5 and 6 deeply bicrucially impressed, producing four high subcoxal ridges on each, a similar but less pronounced condition appears also on segments 8 and 9. Gonopod aperture of moderate size, lateral and caudal edges strongly elevated.

Gonopods as illustrated in Figures 6 and 7, basically similar to those of *P. tidus*.

Remarks: In the context of gonopod structure, this species can scarcely be distinguished from its geographically nearest relative, *P. tida* (CHAMBERLIN), and subsequent collecting in the area between their respective localities may suggest a subspecific relationship.

I venture to recognize the two as distinct, however, on the basis of several peripheral differences. In *tida* the midbody paranota are distinctly smaller (in animals of exactly the same body size), are less evenly rounded anterolaterally, less acutely produced caudad, and the peritreme is appreciably broader, as comparison of the respective drawings will show. In *tida* the epiproct is distinctly shorter and less noticeably constricted basad, and the hypoproct is more acutely produced mesad.

The coloration of the specimens of *tida* (and its synonym *A. pongus*) was apparently faded by the preservation even by the time CHAMBERLIN saw them in 1940, but on a few segments there is the slightest indication of a large oval middorsal spot similar to that of *epiclysmus*.

Pycnotropis tida (CHAMBERLIN), comb. nov. (Figs. 9-11)

Phinotropis tidus CHAMBERLIN, 1941, Bull. Amer. Mus. Nat. Hist., 78: 499, figs. 213-214. Holotype ♂ (AMNH) from Iquitos, Peru, H. BASSLER leg. August 1928.

Amydrinus pongus CHAMBERLIN, 1941, Bull. Amer. Mus. Nat. Hist., 78: 500, figs. 219-221. Holotype ♂ (AMNH) from Pongo de Manseriche, Dpto Loreto, Peru, H. BASSLER leg. August 1924. **New Synonymy!**

Direct comparison of the holotypes of the two names cited above yielded not a single point of difference between them; it is a milestone even in the history of CHAMBERLINian superficiality that each would have been proposed as type of a new genus. As quoted in a preceding paragraph, the verbal description of *P. tidus* absolutely contradicted the sole "difference" advanced in justification of the genus *Amydrinus*.

In actuality, differences between *P. tida* and *P. epiclysmus* are certainly not dramatic ones, and it would be difficult to maintain the two names as separate on the basis of gonopod structure alone. A subspecific level of relationship is certainly not to be excluded.

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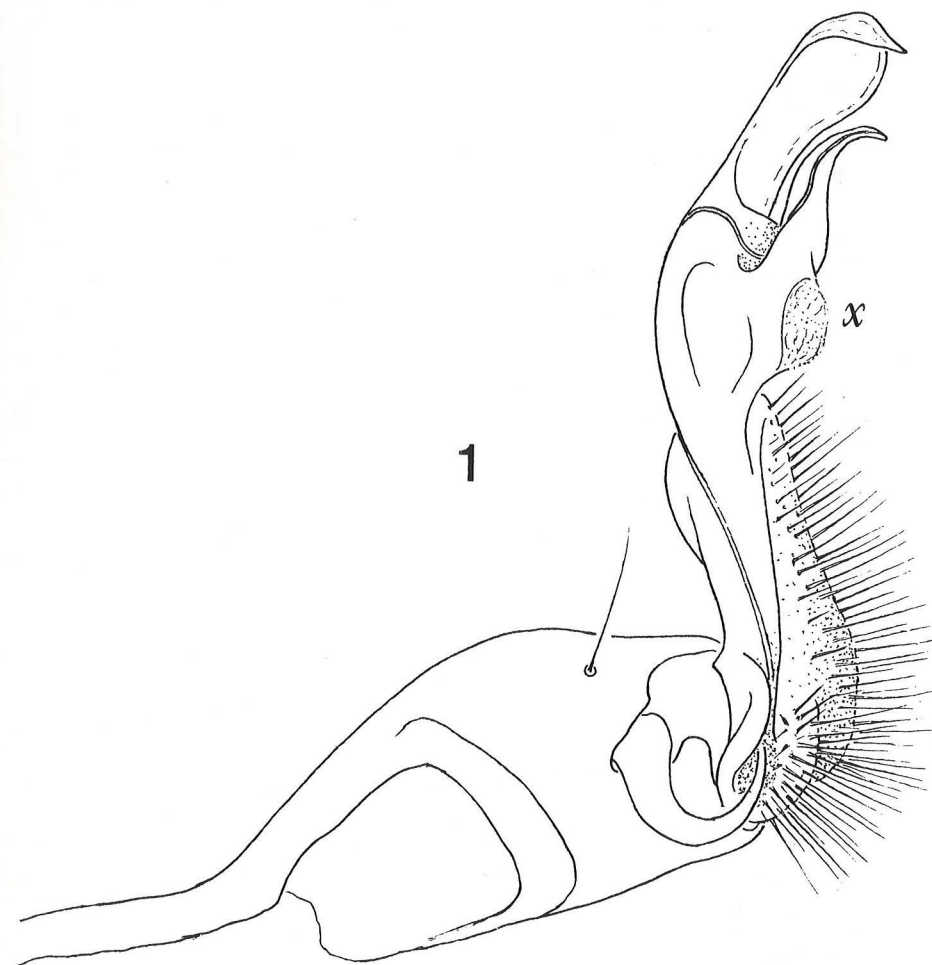
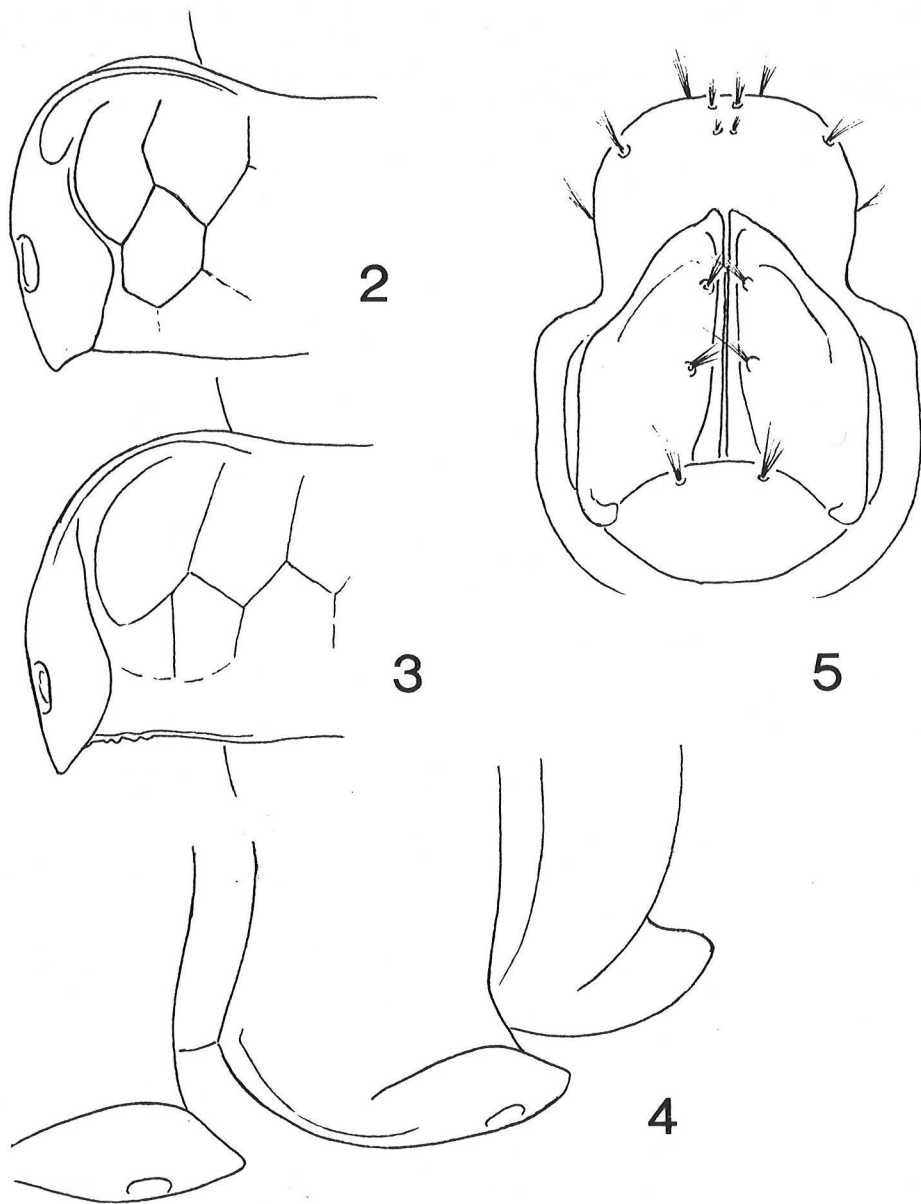


Fig. 1:
Pycnotropis taenia (PETERS). Left gonopod, mesal aspect, specimen compared by CARL with syntypes; "X" = femoral vesicula.

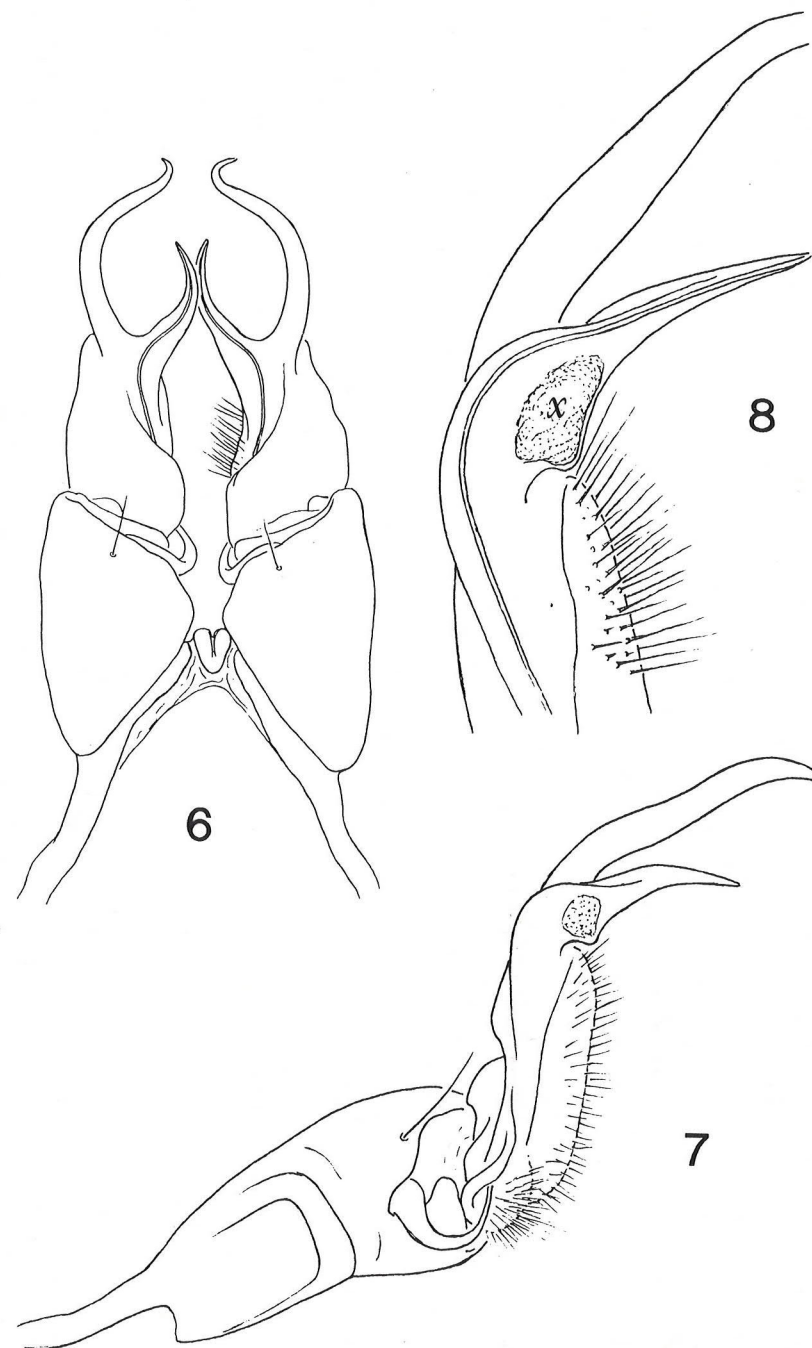


Figs. 2-5:

Pycnotropis epiclysmus, n. sp., ♂ holotype.

2: left paranotum of 5th body segment; 3: left paranotum of 10th body segment;

4: left side of segments 17-19, dorsal aspect; 5: body segment 20, ventral aspect, showing shape and details of hypoproct, paraprocts, and epiproct.

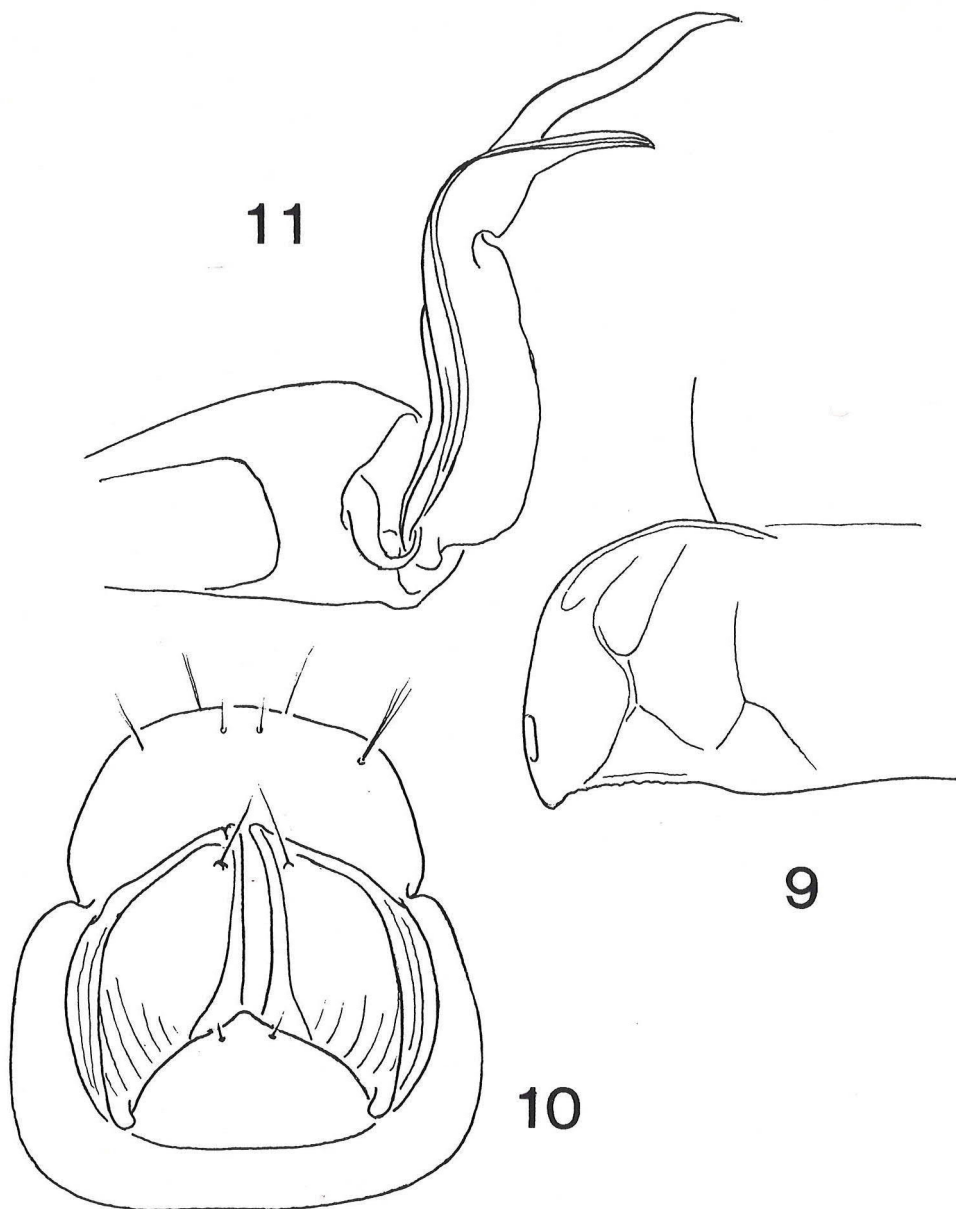


Figs. 6-8:

Pycnotropis epiclysmus, n. sp., ♂ holotype.

6: gonopods, anterior (dorsal) aspect, to show details of sternal structure;

7: left gonopod, mesal aspect; 8: median region of telopodite, mesal aspect, enlarged; "X" = vesicula.



Figs. 9-11:

Pycnotropis tida (CHAMBERLIN), ♂ holotype.

9: left paranotum of 10th body segment (compare width and apical projection of peritreme with that shown in Fig. 3); 10: body segment 20, ventral aspect (compare median projection of hypoproct and relative length of epiproct with the same details in Fig. 5); 11: left gonopod, mesal aspect.